

Interim Performance Report

Investigating the effects of mixed-severity wildfires and timber harvest management on interspecific competition and population dynamics of the mesocarnivore guild in northern California and southern Oregon

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By

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Background

Sustainable forest management practices must preserve ecosystem services while also ensuring a productive timber industry. Problems related to maintaining fishers (*Pekania pennanti*) in healthy ecosystems epitomize the vulnerabilities of forest management practices to conservation efforts, especially related to ecological disturbances. Although not currently listed as threatened or endangered by USFWS, the fisher remains a species of concern in California and in the Pacific states (USDI Fish and Wildlife Service 2016). Previous research has indicated potential short- and long-term tradeoffs between fuels-management activities and fisher persistence (e.g., Scheller et al. 2011, Sweitzer et al. 2016). Investigating the effects of management practices and forest fires on a well-studied population of fishers will allow us to disentangle differences in the effects of one disturbance from another. A better understanding of how fishers respond to habitat changes induced by timber- and fuels-management practices and mixed-severity wildfires is necessary in California, where a future of increased wildfire frequency and intensity is predicted (McKenzie et al. 2004). Our history of monitoring a fisher population in Northern California and Southern Oregon provides sufficient long-term data needed to delineate the effects of timber management and associated ecological disturbances from any naturally occurring variations on the landscape.

Additionally, understanding the limits to population growth and to recolonization is imperative for sensitive species that have been extirpated from previously occupied habitats. Once numerous in western forests, the distribution of fisher contracted over the last century due to harvest of fishers for fur and habitat changes associated with logging (Aubry and Houston 1992, Kucera et al. 1995). Current conservation and management practices have yet to see an increase in the population numbers and distribution of fishers in areas previously occupied aside

from translocation efforts in California and Washington. One hypothesis for why fisher populations across most of their range in the Pacific Northwest have yet to expand into historically occupied habitats is that interspecific competition from other members of the carnivore guild may limit their presence and abundance. Furthermore, habitat change via natural (e.g., wildfire) and human-caused disturbances (e.g., timber harvest and wildfire prevention activities) may affect the relationships within the carnivore guild. Thus, it is important to investigate the effects other members of the carnivore guild have on fishers in regions experiencing varying levels of timber harvest, habitat management, and ecological disturbances.

Task 1. Non-invasive genetic survey

Non-invasive genetic surveys of fishers have been conducted in the Klamath-Siskiyou Ecoregion in northern California and southern Oregon annually between September and December since 2006. We have 8 years of data before the fires occurred, and currently 3 years of data following the fires. We made all necessary preparations during the reporting period and began collecting non-invasive genetic data on fishers in the fall of 2017. These additional data will increase our post-fire sample size to four years, providing a significant increase in the power of our analyses.

Task 2. Disentangle the effects of timber harvest, forest management activities, and fire on fishers in the Klamath-Siskiyou Ecoregion.

To be completed during final reporting period.

Task 3. Evaluate the effects of interspecific competition on fisher population dynamics and space-use

To be completed during final reporting period.

Financial Reporting

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A handwritten signature in dark ink, appearing to be 'Sean Matthews', with a long, sweeping horizontal stroke extending to the right.

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